A Framework for Semantic Data Integration and Inferencing on Cervical Cancer

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Abstract: Advances in the area of biomedicine and bioengineering have allowed for more accurate and detailed data acquisition in the area of health care. Examinations that once were time- and cost-forbidding, are now available to public, providing physicians and clinicians with more patient data for diagnosis and successful treatment. These data are also used by medical researchers in order to perform association studies among environmental agents, virus characteristics and genetic attributes, extracting new and interesting risk markers which can be used to enhance early diagnosis and prognosis. Nevertheless, scientific progress is hindered by the fact that each medical center operates in relative isolation, regarding datasets and medical effort, since there is no universally accepted archetype/ontology for medical data acquisition, data storage and labeling. This, exactly, is the major goal of ASSIST: to virtually unify multiple patient record repositories, physically located at different laboratories, clinics and/or hospitals. ASSIST focuses on cervical cancer and implements a semantically-aware integration layer that unifies data in a seamless manner. Data privacy and security are ensured by techniques for data anonymization, secure data access and storage. Both the clinician as well as the medical researcher will have access to a knowledge base on cervical cancer and will be able to perform more complex and elaborate association studies on larger groups.